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WD #459789.DOC

CLEAN VERSION OF PENDING CLAIMS

IMPROVED BOLOMETER OPERATION USING FAST SCANNING
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1. (Once Amended) A method for improving performance sensitivity and facility of operation of an array including one or more microbolometers, comprising:

applying two or more bias pulses substantially sequentially during a frame time to each of the microbolometers in the array;

measuring two or more resulting signals corresponding to the bias pulses;

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computing an average signal value from the resulting signals corresponding to each of the microbolometers in the array during the frame time; and

producing an output signal based on the computed average signal value for each of the microbolometers in the array during the frame time.

2. (Once Amended) The method of claim 1, further comprising:

repeating the applying, measuring, computing, and producing steps to compute output signals during each frame time.

3. (Once Amended) The method of claim 2, further comprising:

applying a corrective electrical signal to the output signal to correct for resistance non-uniformity between the one or more microbolometers in the array to obtain a substantially uniform output signal value.

4. (Once Amended) The method of claim 3, further comprising:

converting the substantially uniform output signal value associated with each of the microbolometers in the array to a digital signal value.

5. (Once Amended) The method of claim 4, further comprising:

passing the digital signal value associated with each of the microbolometers in the array through a digital image processor to correct for image defects.

6. (Once Amended) The method of claim 5, wherein the image defects comprises:

image defects selected from the group consisting of fine offsets, gain non-uniformity, and dead pixels.

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7. The method of claim 1, wherein the bias pulses are substantially equal in magnitude.

8. The method of claim 1, wherein the bias pulses are substantially equally spaced in time.

9. (Once Amended) The method of claim 1, wherein the two or more bias pulses comprise:

two or more voltage bias pulses.

10. (Once Amended) The method of claim 1, wherein the resulting signals comprise:

two or more bias current signals.

11. The method of claim 1, wherein the bias pulses are in the range of about 2 to 100 bias pulses.

12. The method of claim 1, wherein each of the two or more bias pulses has a time duration in the range of about 0.1 to 20 microseconds.

13. The method of claim 1, wherein the frame time is the time it takes for the array to produce a complete image of an object being viewed by the array.

14. (Once Amended) An infrared radiation detector apparatus, comprising:

microbolometers in an array;

a timing circuit coupled to the array to apply two or more bias pulses substantially sequentially to each of the microbolometers in the array during a frame time;

a measuring circuit coupled to the array to measure two or more resulting signals associated with each of the applied two or more bias pulses during the frame time;

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a computing circuit coupled to the measuring circuit to compute an average signal value for each of the microbolometers in the array from the measured two or more resulting signals during the frame time; and

an output circuit coupled to the computing circuit to produce an output signal based on the computed average signal value for each of the microbolometers in the array during the frame time.

15. (Once Amended) The apparatus of claim 14, wherein the output circuit further comprises:

an integrator and an A/D converter to convert the output signal value to a digital signal value for each of the microbolometers in the array.

16. (Once Amended) The apparatus of claim 15, wherein the measuring circuit further comprises:

a digital image processor, coupled to the output circuit to receive the digital signal value associated with each of the microbolometers of the array and correct the received digital signal value for image defects.

17. (Once Amended) The apparatus of claim 16, wherein the digital image further comprises:

a correction circuit, to apply a corrective electrical signal based on a correction value to the output signal to correct for resistance non-uniformity in each of the microbolometers of the array to obtain a uniform output signal value.

18. (Once Amended) The apparatus of claim 17, wherein the correction circuit further corrects the uniform output signal value for fine offsets, gain non-uniformity, or dead pixels.

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19. (Once Amended) The apparatus of claim 18, wherein the digital image processor further comprises:

digital memories to store correction values for each of the microbolometers in the array.

20. The apparatus of claim 14, wherein the two or more bias pulses are substantially equal in magnitude.

21. The apparatus of claim 20, wherein the two or more pulses are substantially equally spaced in time.

22. The apparatus of claim 14, wherein the two or more bias pulses are voltage bias pulses.

23. The apparatus of claim 22, wherein the resulting signals are current signals.

24. The apparatus of claim 14, wherein the two or more bias pulses are in the range of about 2 to 100 bias pulses.

25. The apparatus of claim 24, wherein the two or more bias pulses have time duration in the range of about 0.1 to 20 microseconds.

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26. The apparatus of claim 14, wherein the frame time is the time it takes for the array to produce a complete image of an object being viewed by the array.

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27. (New) A signal processing electronics circuit for an array including one or more microbolometers, comprising:

a timing circuit coupled to the array to apply two or more bias pulses substantially sequentially to each of the microbolometers in the array such that the resulting temperature in each of the microbolometers in the array due to the application of the bias pulses is substantially uniform during a frame time;

a measuring circuit coupled to the array to measure two or more resulting signals, respectively associated with each of the applied bias pulses during the frame time;

a computing circuit coupled to the measuring circuit to compute an average signal value for each of the microbolometers in the array from the measured resulting signals during the frame time; and

an output circuit coupled to the computing circuit to produce an output signal based on the computed average signal value for each of the microbolometers in the array during the frame time.

28. (New) The circuit of claim 27, wherein the output circuit further comprises:

a correction circuit to apply a corrective electrical signal to the output signal to correct for resistance non-uniformity in each of the microbolometers of the array to a obtain a uniform output signal value.

29. (New) The circuit of claim 28, wherein the output circuit further comprises:

an integrator and an A/D converter to convert the uniform output signal value to a digital signal value for each of the microbolometers in the array.

30. (New) The circuit of claim 29, further comprising:

a digital image processor coupled to the output circuit to receive the digital signal value associated with each of the microbolometers of the array to correct for image defects such as fine offsets, gain non-uniformity or dead pixels.

31. (New) The circuit of claim 30, wherein the digital image processor further comprises:

a correction circuit to apply a corrective electrical signal based on a correction value to the output signal to correct for any resistance non-uniformity in each of the microbolometers of the array to a obtain a uniform output signal value.

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32. (New) The circuit of claim 31, further comprising:

a memory to store the correction value associated with each microbolometer in the array.

33. (New) The circuit of claim 27, wherein the two or more bias pulses are substantially equal in magnitude.

34. (New) The circuit of claim 33, wherein the two or more pulses are substantially equally spaced in time.

35. (New) The circuit of claim 27, wherein the two or more bias pulses are voltage bias pulses.

36. (New) The circuit of claim 35, wherein the resulting signals are current signals.

37. (New) The circuit of claim 27, wherein the two or more bias pulses are in the range of about 2 to 100 bias pulses.

38. (New) The circuit of claim 37, wherein the two or more bias pulses have time duration in the range of about 0.1 to 20 microseconds.

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39. (New) The circuit of claim 27, wherein the frame time is the time it takes for the array to produce a complete image of an object being viewed by the array.